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EXAMINER

WOLLSCHLAGER, JEFFREY MICHAEL

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* TAKASHI MIYAKAWA  
and  
SATORU INOUE

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Appeal 2008-4337  
Application 10/717,502  
Technology Center 1700

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Decided: November 25, 2008

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Before BRADLEY R. GARRIS, ROMULO H. DELMENDO, and  
JEFFREY T. SMITH, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from a final rejection of claims 1-10 and 13 (Supplemental Appeal Brief filed January 10, 2008, hereinafter “App. Br.,” Final Office Action mailed December 4, 2006). We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

### STATEMENT OF THE CASE

Appellants state that the invention “relates to a process for producing a formed honeycomb body which is an intermediate for production of a honeycomb structure suitably used, for example, as a diesel particulate filter or as a carrier for catalyst for purification of automobile exhaust gas” (Specification, hereinafter “Spec.,” 1, ll. 8-12).

Claims 1 and 3 on appeal read as follows:

1. A process for producing a formed honeycomb body, the process comprising:

mixing, by a mixer, a raw material for forming a honeycomb body structure containing at least a ceramic raw material powder, a binder and water, to obtain a compounded mixture for forming a green body;

adding a predetermined amount, to the raw material for forming the honeycomb body, a powdery material obtained by crushing, into a maximum particle diameter of 50 mm or smaller, a crushed green body having substantially same composition as the compounded mixture for forming the green body, the crushed body being obtained from a rejected product of an undried formed material, and a resulting mixture is mixed thoroughly by the mixer to obtain the compounded mixture for forming the green body; and

kneading and extruding the compounded mixture for forming the green body into a honeycomb shape by a continuous extruder, to obtain the formed honeycomb body;

wherein the mixer includes a hoe that rotates at a low speed and a chopper having a cross-shaped blade that rotates at a high speed.

3. A process for producing a formed honeycomb body according to Claim 1, wherein the crushed green body is added

in an amount about 30 parts by mass or less relative to about  
100 parts by mass of the ceramic raw material powder.

(App. Br. A-19, Claims Appendix)

The prior art relied upon by the Examiner in rejecting the claims on  
appeal is:

Asami	4,851,376	Jul. 25, 1989
Brown	5,900,051	May 4, 1999
Kasuya	JP 55-152011A	Nov. 27, 1980

(English language translation of record)

The Examiner rejected the claims as follows: claims 1-10 and 13  
under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of  
Asami, JP 55-152011A, and Brown (Examiner's Answer mailed March 6,  
2008, hereinafter "Ans.," 4-17).

Appellants have argued claims 1-10 and 13 together except they have  
submitted separate arguments under a heading specific to claims 3 and 4 and  
another heading specific to claims 1-10. We address these arguments by  
focusing on claims 1 and 3. *See* 37 C.F.R. § 41.37(c)(1)(vii).

The Examiner found that Asami describes every limitation of  
appealed claim 1 except that it does not teach: (i) "mixing of undried  
reclaimed material [i.e., a powdery material obtained] with a raw ceramic  
material"; and (ii) "mixing with the claimed mixer" (Ans. 4). The Examiner,  
however, found that: (1) JP 55-152011A "teaches mixing of a  
reclaimed/returned extruded ceramic material, with out drying, with a raw  
ceramic/pottery material" and further shaping the mixture in an extruder;  
and (2) Asami "suggests that water may be added to a dried reclaimed  
material in order to reduce the mechanical impact on the particles" (Ans. 4).

On the basis of these findings, the Examiner reasoned that “a person of ordinary skill in the art would have found it obvious to have mixed the reclaimed/returned extruded ceramic material, with out drying, with a raw ceramic material, as taught by JP 55-152011A, in the process of Asami . . . and would have been motivated to do [so] in order to eliminate an undesired process step, namely that of drying . . .” (Ans. 4-5). As to the claimed mixer (“a hoe that rotates at a low speed and a chopper having a cross-shaped blade that rotates at a high speed”), the Examiner found that the claimed mixer is a well known mixer and concluded that “it would have been *prima facie* obvious to one having ordinary skill in the art . . . to have employed the mixer disclosed by Brown as the mixer in the method of Asami . . . because Brown suggests such a mixer can effectively blend materials in a short amount of time . . . and further suggests that such a mixer is effective at forming appropriate sized agglomerates of particles for further use that don’t tend to cake or form lumps . . .” (Ans. 5). With respect to claim 3, the Examiner held that although “Asami . . . does not teach a specific mixture of the reclaimed materials to raw materials. . . a person of ordinary skill in the art would have found it obvious to have optimized the relative ratios of reclaimed material to raw materials through routine experimentation . . . and would have been motivated to do so in order to provide an economical and stable product” (Ans. 5-6).

Appellants, on the other hand, contend that the Examiner “failed to provide a proper suggestion or motivation to combine Asami with [JP 55-152011A]” (App. Br. 11) and “fail[ed] to specifically address the claimed mixer including ‘a hoe that rotates at a low speed and a chopper having a cross-shaped blade that rotates at a high speed’” (App. Br. 14). Regarding

claim 3, Appellants assert that “[w]hile only routine skill in the art may be required to discover an optimum value of a *recognized* result-effective variable, the relative ratios . . . are not recognized in the prior art as a result-effective variable” (App. Br. 16).

## ISSUES

Thus, the issues arising from the contentions of the Examiner and Appellants are:

I. Have Appellants shown error in the Examiner’s determination that a person having ordinary skill in the art would have been led to mix the claimed powdery material with a raw material in Asami?

II. Have Appellants shown error in the Examiner’s determination that a person having ordinary skill in the art would have found it obvious to carry out Asami’s mixing step in a mixer including “a hoe that rotates at a low speed and a chopper having a cross-shaped blade that rotates at a high speed?”

III. Have Appellants shown error in the Examiner’s determination that a person having ordinary skill in the art would have been led to arrive at the claimed relative mass ratio of the “crushed green body” to the “ceramic raw material powder?”

## FINDINGS OF FACT

1. Oral arguments were heard on November 5, 2008.
2. Asami describes a process for producing a honeycomb structure from a cordierite ceramic body including reclaimed cordierite composition obtained from a dried, unfired shaped body or its

fragments, which is/are rejected and recovered before the shaped body is fired into the cordierite ceramic material (col. 3, ll. 31-32. 42-49).

3. Asami further teaches that the reclaimed cordierite material may be crushed into small pieces having an average diameter of about 50 mm (col. 3, ll. 50-56; col. 8, ll. 12-17).
4. Additionally, Asami discloses that water may be added to the dried, unfired scrap or its fragments and that this “allows the scrap to be easily and effectively divided into particles, without giving mechanical impacts to the particles” (col. 3, ll. 56-61; col. 8, ll. 45-52).
5. Asami teaches that the reclaimed cordierite composition may be used in admixture with a fresh mass of a cordierite composition in an amount ranging from 2.5% to 100% by weight (col. 3, ll. 64-68; col. 8, ll. 60-65).
6. Asami discloses that the mixture of reclaimed and fresh cordierite compositions are combined with binder and water and then the resulting mixture is kneaded and extruded to form the honeycomb structure (col. 13, ll. 26-38).
7. JP 55-152011A teaches a molding method for a wet pottery raw material in which after a pottery material containing water is sufficiently kneaded, part of this kneaded material is returned to a point in the process prior to kneading to enable easier kneading and to obtain a molding with fewer distortions (Translation 1).

8. Brown teaches the use of a variable-speed Littleford Plowshare Mixer configured with two plows and one 4-bar “Christmas Tree Chopper” to mix two colors of pigmented particles with the plows blending at a speed of about 155 rpm and the chopper rotating at about 3,600 rpm (col. 5, ll. 28-32; col. 6, ll. 6-14).
9. The Littleford Plowshare Mixer described in Brown provides thorough chopping and mixing of solid pigment particles with non-dusting, low degradation rates, high flowability or dispersability, and non-formation of clumps or caking when stored for long periods of time (col. 5, ll. 36-48).
10. It is undisputed that Brown’s Littleford Plowshare Mixer is the same mixer specified in Appellants’ claim 1.
11. Appellants acknowledge that “[t]he ceramic molding arts, in certain instances, may use a mixer having a hoe or a single or twin screw extruder” (App. Br. 14).

#### PRINCIPLES OF LAW

On appeal to this Board, Appellants must show that the Examiner committed error in finally rejecting the claims. *Cf. In re Kahn*, 441 F.3d 977, 985-986 (Fed. Cir. 2006) (“On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.”) (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)); *see also* 37 C.F.R. § 41.37(c)(1)(vii).

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such



that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1734 (2007).

*KSR* reaffirms the analytical framework set out in *Graham v. John Deere Co.*, 383 U.S. 1 (1966), which states that an objective obviousness analysis includes: (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; and (3) resolving the level of ordinary skill in the pertinent art. *KSR*, 127 S. Ct. at 1734. Secondary considerations such as commercial success, long felt but unsolved needs, or failure of others “‘might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.’” *Id.* (quoting *Graham*, 383 U.S. at 17-18).

*KSR* disapproved a rigid approach to obviousness (*i.e.*, an analysis *limited to* lack of teaching, suggestion, or motivation). *KSR*, 127 S. Ct. at 1741 (“The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents.”). *See also DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006) (“Our suggestion test is in actuality quite flexible and not only permits, but *requires*, consideration of common knowledge and common sense”); *Alza Corp. v. Mylan Labs., Inc.*, 464 F.3d 1286, 1291 (Fed. Cir. 2006) (“There is flexibility in our obviousness jurisprudence because a motivation may be found *implicitly* in the prior art. We do not have a rigid test that requires an actual teaching to combine...”).

*KSR* further instructs “that when a patent claims a structure already known in the prior art that is altered by mere substitution of one element for another known in the field, the combination must do more than yield a predictable result.” *KSR*, 127 S. Ct. at 1740.

When a product recited in product-by-process format reasonably appears to be the same as or obvious from a product of the prior art, the burden is on applicant to show that the prior art product is in fact different from the claimed product, even though the products may be made by different processes. *Cf. In re Thorpe*, 777 F.2d 695, 697 (Fed. Cir. 1985). This principle applies even in the context of a process claim that recites a step of using a product that defined by the method by which it is produced. *Cf. In re Hirao*, 535 F.2d 67, 69 (CCPA 1976).

“The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages.” *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003).

## ANALYSIS

The Examiner found that Asami teaches a method as here claimed except the reference does not disclose mixing undried reclaimed cordierite material (*i.e.*, reclaimed cordierite composition containing water) with fresh cordierite material in the claimed mixer (Ans. 4; Facts 2-6). Nevertheless, the Examiner found that Asami teaches the addition of water to dried, reclaimed cordierite (Ans. 4). Further, JP 55-152011A teaches the advantages of recycling (*i.e.*, reclaiming) ceramic slurry material into the mixer to enable easier kneading and to obtain a molding with fewer

distortions (Fact 7). Furthermore, the Examiner found that the claimed mixer is a well known mixer, which provides thorough chopping and mixing for solid pigment particles with non-dusting, low degradation rates, high flowability or dispersability, and non-formation of clumps or caking when stored for long periods of time (Facts 8-11).

Given these facts, we share the Examiner's view that a person having ordinary skill in the art would have found it *prima facie* obvious to mix undried (*i.e.*, wet) reclaimed cordierite composition with fresh cordierite composition with the reasonable expectation of eliminating a drying step. While Asami does not explicitly state that wet reclaimed cordierite is crushed to smaller particles, Asami teaches adding water to reclaimed material that is in fragmented (*i.e.*, crushed) form (Fact 4). Hence, contrary to Appellants' belief (App. Br. 11), we see no basis to reverse the Examiner's rejection on the argument that Asami would not have suggested crushing wet reclaimed cordierite. In any event, we find no error in the Examiner's conclusion that a person having ordinary skill in the art would have found it *prima facie* obvious to use Brown's mixer in Asami's mixing process under appropriate shear conditions in order to obtain the advantages taught in Brown. When such a mixer is used in Asami, it would reasonably appear that the reclaimed materials would undergo effective particle division as suggested by Asami (Fact 4). Appellants have not demonstrated otherwise.

Moreover, claim 1 recites "adding a predetermined amount . . . [of] a powdery material obtained by crushing . . . the crushed body being obtained from a rejected product of an undried formed material . . . ." While it is true that Asami teaches the use of a mixture obtained by adding water to dried

reclaimed material, Appellants have not shown that the use of “undried formed material” results in a different “powdery material.” *Cf. In re Thorpe*, 777 F.2d at 697; *In re Hirao*, 535 F.2d at 69. To the extent that Appellants are contending that “powdery material” excludes a slurry (*i.e.*, excludes water) (App. Br. 12), Asami teaches that dried reclaimed cordierite may be used (Fact 2-3).

Appellants argue that “Asami uses dried cordierite articles specifically because of the art-recognized problems with reusing undried green bodies . . .” (App. Br. 12-13.) But Appellants have not directed us to any experiments or other persuasive evidence establishing that such problems exist.

Appellants contend that the amount of crushed green body relative to the ceramic raw material powder has not been shown to be a result-effective variable (App. Br. 16-17). Again, Appellants have failed to show error. Asami teaches the suitable amounts of reclaimed material that may be added and thus the claimed range is *prima facie* obvious (Fact 5). Here, a person having ordinary skill in the art would have found the optimum or workable amounts through nothing more than routine experimentation. *In re Peterson*, 315 F.3d at 1330.

We have fully considered all the arguments, including those in the Reply Brief filed on April 29, 2008, but find them unpersuasive for reasons given above.

For these reasons, we uphold the Examiner’s rejection of all the appealed claims.

### CONCLUSION

On this record, we determine that Appellants have failed to demonstrate any error in the Examiner's determination that: (i) a person a having ordinary skill in the art would have been led to mix the claimed powdery material with a raw material in Asami; (ii) a person having ordinary skill in the art would have found it obvious to carry out Asami's mixing step in a mixer including "a hoe that rotates at a low speed and a chopper having a cross-shaped blade that rotates at a high speed"; and (iii) a person having ordinary skill in the art would have been led to arrive at the claimed relative mass ratio of the "crushed green body" to the "ceramic raw material powder."

### DECISION

The Examiner's decision to reject appealed claims 1-10 and 13 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a) (1) (iv).

### AFFIRMED

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